

## REMARKS

In the Office Action dated April 16, 2002, claims 22-40 have been rejected under 35 U.S.C. §101 as allegedly lacking patentable utility. Claims 21-40<sup>1</sup> have been rejected under 35 U.S.C. §112, first paragraph as allegedly lacking enabling support. Claims 21-40 (presumably 22-40) have been rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Balaji et al., U.S. Patent No. 5,612,895 (hereinafter “Balaji et. al.”) in view of Cohen et al. (U.S. Patent No. 5,878,373 (hereinafter “Cohen et al.”) or Lee et al., U.S. Patent No. 5,421,470 (hereinafter “Lee et al.”).

This response addresses each of the Examiner’s rejections. Accordingly, the present application is in condition for allowance. Favorable consideration of all pending claims is therefore respectfully requested.

Claims 22-40 have been rejected under 35 U.S.C. §101 as allegedly lacking patentable utility. Citing the Utility Examination Guidelines and Guidelines for Examination of Patent Applications under 35 U.S.C. §112, first paragraph, the Examiner alleges that the specification does not provide any “real world” substantial utility of the claimed method. Applicants respectfully submit that the present invention provides a credible utility, consistent with the requirements of the Utility Examination Guidelines. To wit, the Examiner’s attention is respectfully directed to the specification at page 4, lines 22-25, wherein the present invention contemplates a method for designing small protein structures which can readily be a source of new antibiotics, pesticides, herbicides or fungicides, for example. Moreover, the claimed method can produce proteins which may be used as catalysts for inorganic syntheses. In addition, the claimed design method can be used to solve the “protein folding problem” i.e. predict the folding

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<sup>1</sup> Applicants believe the Examiner intended to reject claims 22-40, inasmuch as claim 21 is no longer pending in the present application.

of natural proteins. Furthermore, Applicants respectfully submit that the skilled artisan can readily follow the detailed roadmap provided by the specification to design proteins having the asserted functions given the numerous art-recognized protein assays available to confirm the function of the designed proteins.

The Examiner has also rejected the claims under 35 U.S.C. §112, first paragraph. Applicants respectfully submit that in view of the credible utility asserted and disclosed and the lack of undue experimentation required to generate proteins by the claimed methods, the requirements of 35 U.S.C. §112, first paragraph are sufficiently met by the present disclosure.

Accordingly, the rejection of claims 22-40 under 35 U.S.C. §§101 and 112, first paragraph is overcome and withdrawal thereof is respectfully requested.

Claims 22-40 have been rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Balaji et al. in view of Cohen et al. or Lee et al. Applicants submit that the cited references fail to teach or suggest the claimed invention. The Examiner alleges that Balaji et al. teach a method for designing peptide mimetics based on a method for predicting a stable tertiary structure of a peptide comprising generating protein backbone configurations using dihedral angles phi and psi, analyzing and plotting the phi, psi angle distribution and determining the state with minimum energy. The Examiner admits that the reference fails to teach the elimination of self-intersecting configurations. Applicants submit that Balaji et al. merely attempt to identify the folded state of particular peptide sequences. Balaji et al. require molecular mechanics to find possible low-energy configurations for a known specific sequence. Notably, Balaji et al. do not suggest, no less motivate the skilled artisan to design new protein structures. In fact, the Balaji et al. method is inoperable unless the “threading” algorithm is employed. Notably, the claimed invention does not require a threading algorithm. Moreover, the claimed method does not require any form of molecular mechanics.

The teaching of the secondary references Cohen et al. or Lee et al. fail to ameliorate the deficiencies of the primary reference. The Examiner alleges that Cohen et al. teach that estimations of hydrophobicity and hydrophilicity are helpful in the verification of 3D models determined from angle or energy calculations. The Examiner also alleges that Lee et al. teach a method for determining peptide 3D structure. Applicants submit that neither Cohen et al. or Lee et al. identify new protein structures. Cohen et al. utilize a threading algorithm, that is they examine a particular sequence on several known protein structures to predict the folding of that sequence. Lee et al. examine the energy of a specific sequence on a particular known protein structure, with fixed backbone, allowing only for different conformations of the side chains. None of the cited references suggest, no less motivate the skilled artisan to generate new protein structures, as claimed. Accordingly, the rejection of claims 22-40 under 35 U.S.C. §103(a) is overcome and withdrawal thereof is respectfully requested.

Thus, in view of the foregoing amendments and remarks, the application is in condition for allowance, which action is earnestly solicited.

Respectfully submitted,



Peter I. Bernstein  
Registration No. 43,497

Scully, Scott, Murphy & Presser  
400 Garden City Plaza  
Garden City, New York 11530  
(516) 742-4343

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